Green Buildings in Canada: An Overview

Alex Zimmerman, President
Canada Green Building Council

Environmental Impact of Buildings*

- ~ 38% of total Canadian secondary energy use[1]
- ~ 30% of total Canadian greenhouse gas emissions [2]
- 40% (3 billion tons annually) of raw materials use globally [3]

* Commercial and residential

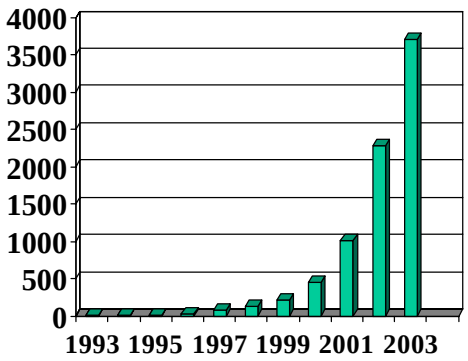
Canada Green Building Council (CaGBC)

- Coalition of public and private building industry leaders
- National nonprofit organization founded Dec 2002, governed by member organizations, private & public
- License holder for LEED® in Canada
- Developer and administrator of LEED® Canada-NC 1.0 Green Building Rating System

www.cagbc.org

USGBC & CaGBC Momentum

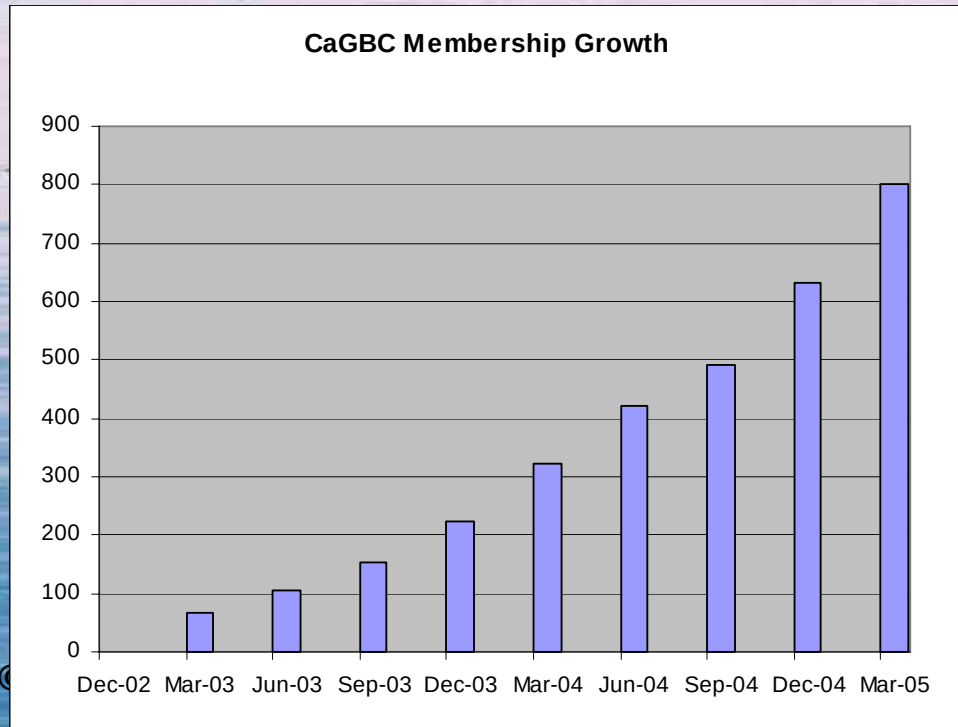
USGBC: Aug. 2004



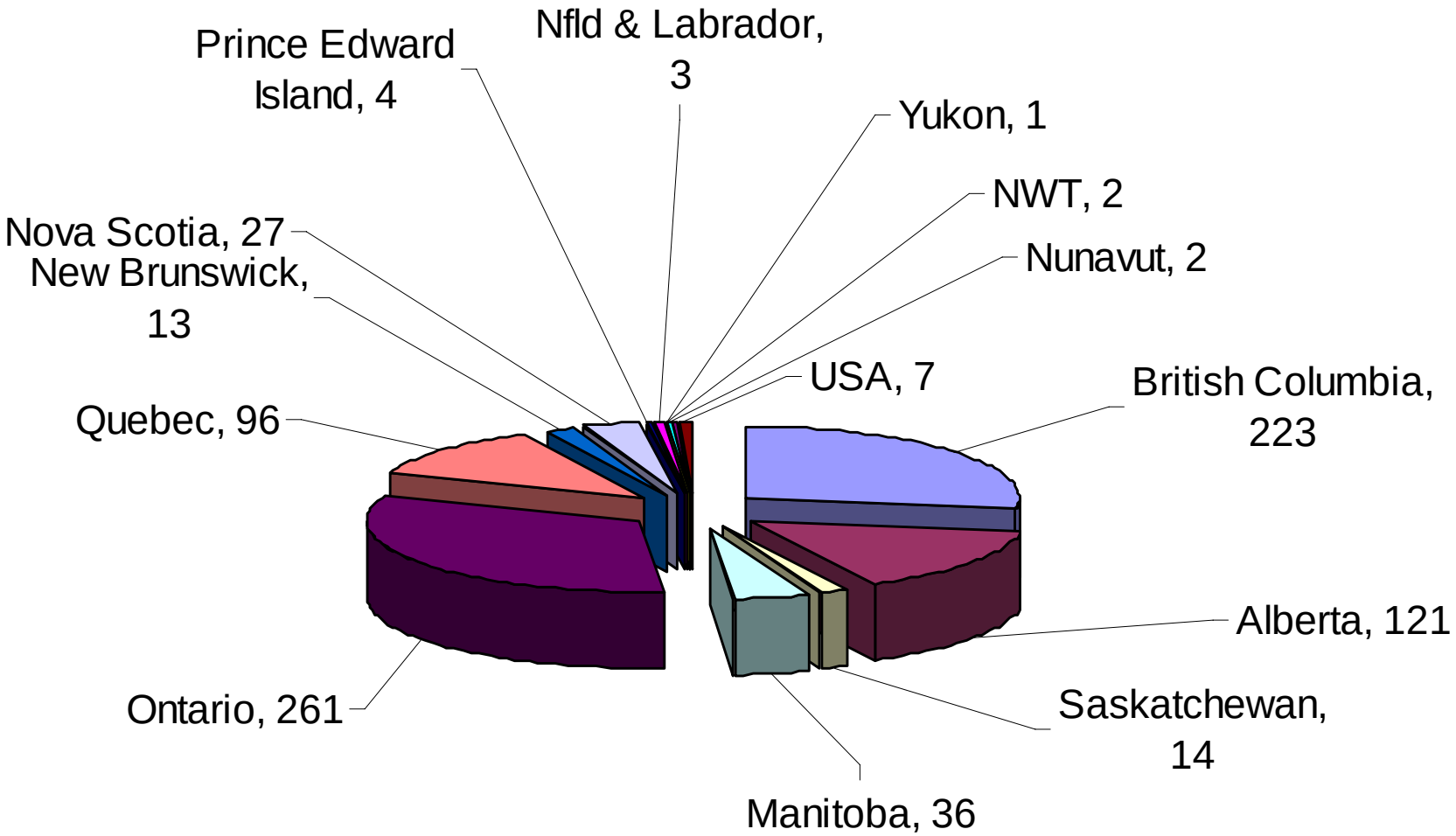
USGBC has over 5,000 member organizations

CaGBC: Dec. 2004

CaGBC growth ~10% per month: currently 800+ member organizations



CaGBC Membership

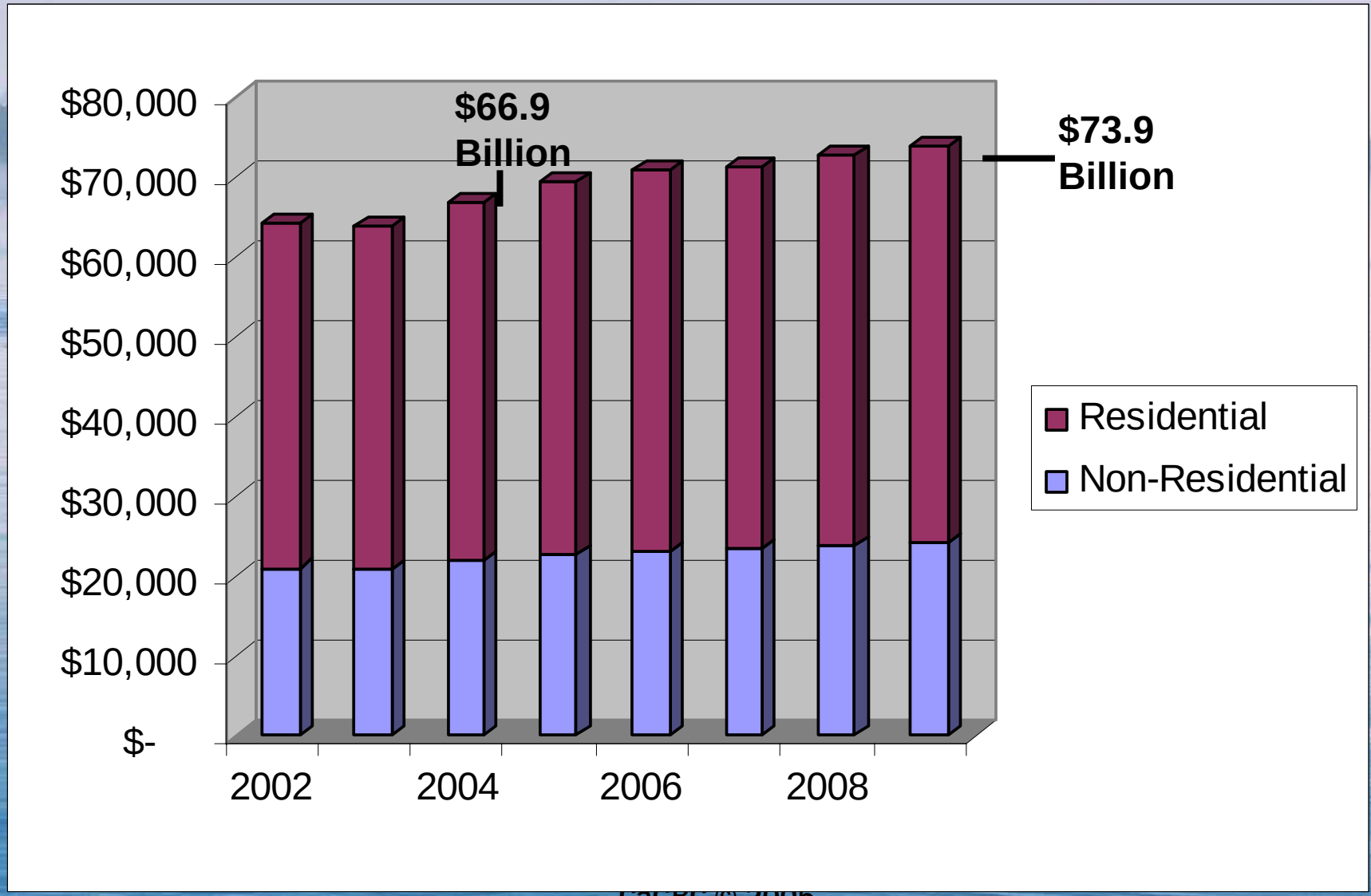


CaGBC Members by Province

810 Total, Apr 26, 2005

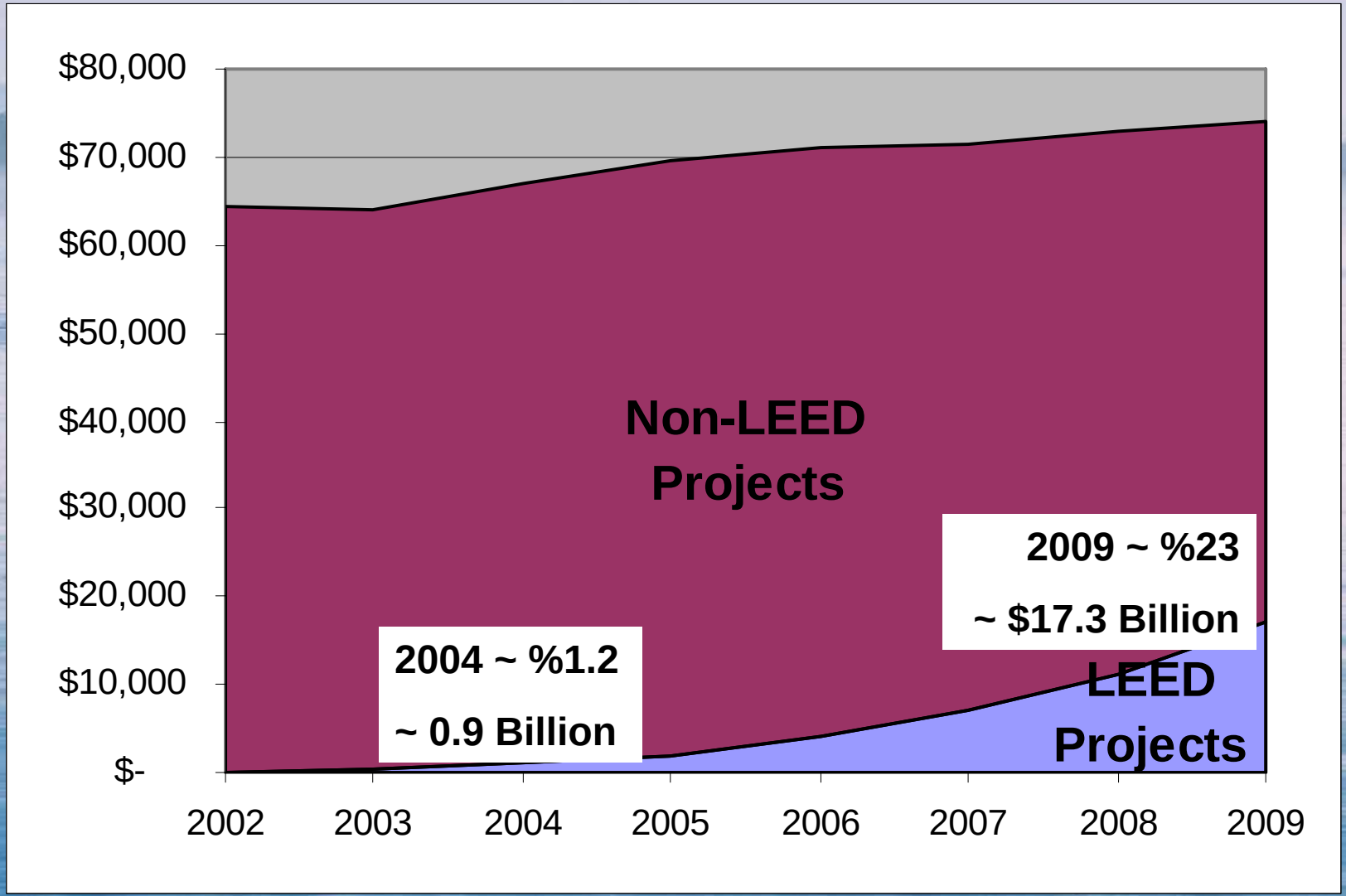
How Big is the Market?

Forecast Value of Building Construction in Canada, Millions of $CAN



What is the Potential for LEED Canada?

Value of Forecast Market Share, Millions of $CAN

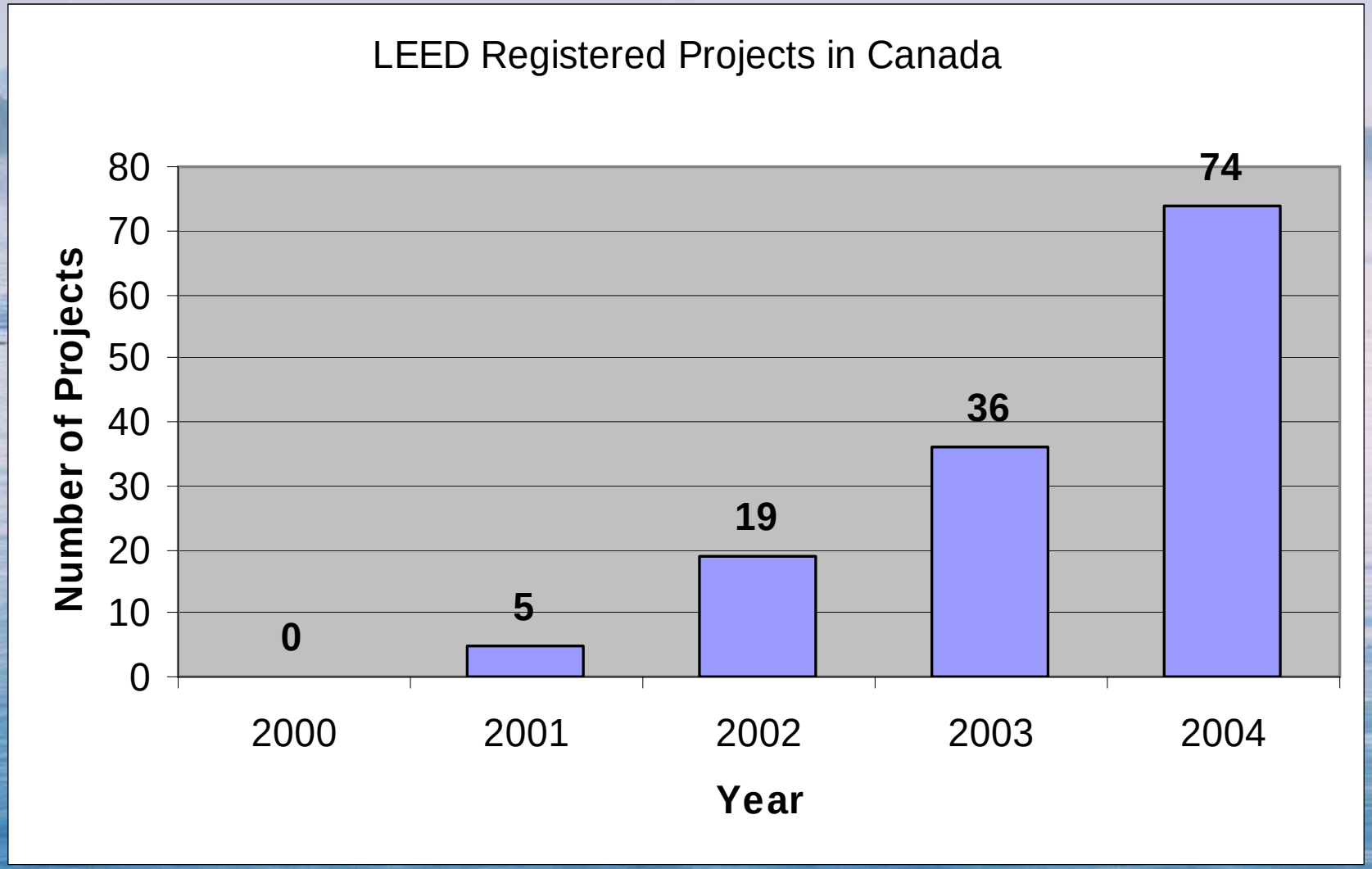


LEED Endorsement in Canada

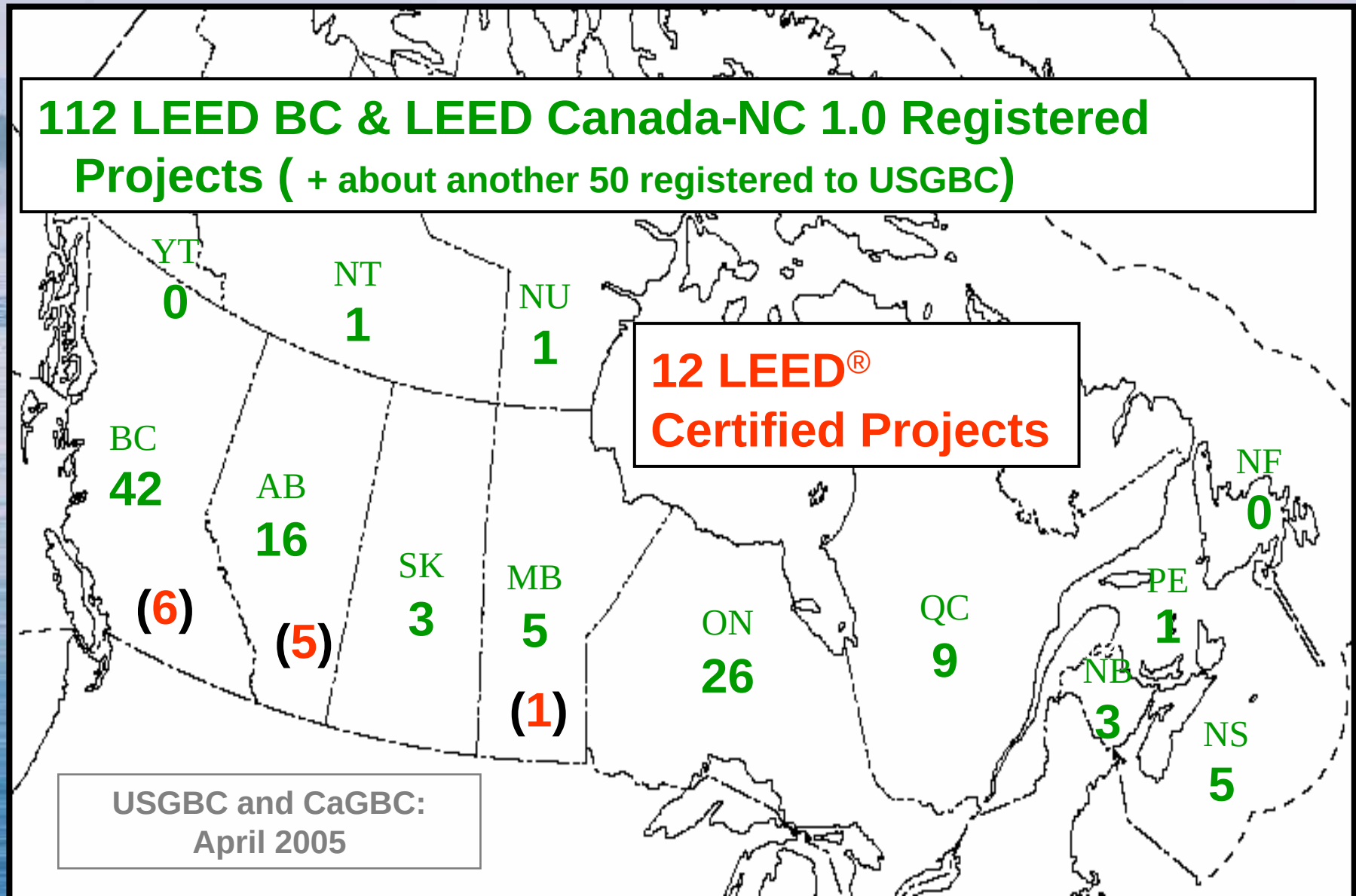
- APEGG BC
- GVRD
- University of BC
- BC Buildings Corporation
- Vancouver 2010 Olympics: *Silver*
- City of Vancouver facilities: *Gold*
- City of Victoria Dockside Lands: *Platinum*

- Alberta Infrastructure Schools Pilot
- City of Calgary Sustainable Buildings Policy
- Manitoba Hydro $150 million building: LEED Gold
- Public Works & Government Services Canada, Capital Projects > $10 million: LEED Gold
- La Société Immobillière du Québec, New Construction & Renovations: LEED Silver
- Toronto Waterfront Revitalization Corporation: LEED Gold

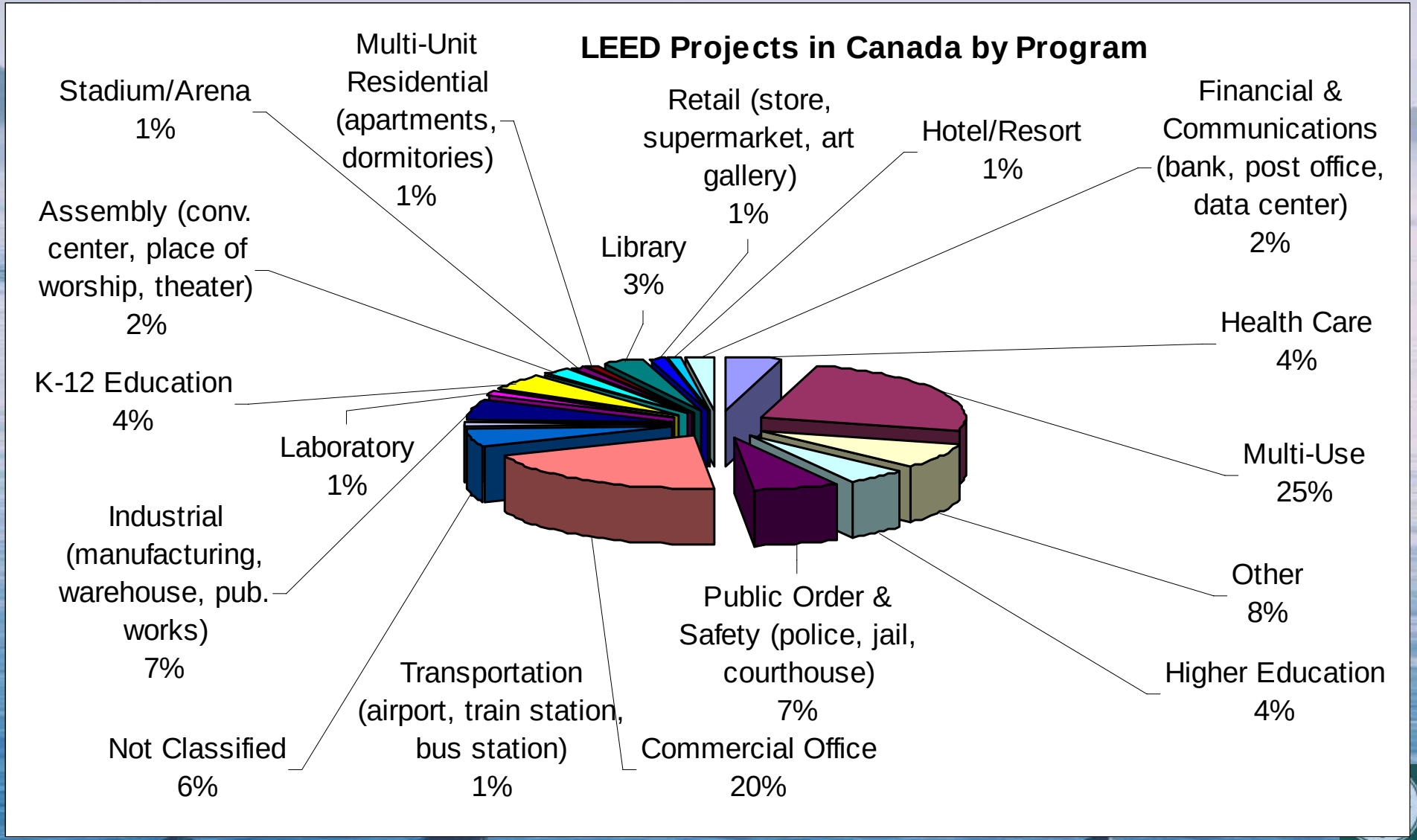
Growth in LEED Registered Projects in Canada



LEED Projects



LEED Projects in Canada by Program Type



LEED Canada-NC 1.0 Changes from USGBC LEED 2.1: Highlights of Major Changes

- Substitution of applicable base Canadian codes, standards, regulations where possible
- Some increases in performance targets, especially energy – aligned with federal gov't
- Clearer definitions of requirements
- Added flexibility in many credits
- One new additional credit, exclusive to Canada – Building Durability

Examples:

2 LEED Certified Projects in Canada
&
One of the greenest commercial projects in the world

LEED Gold: 44 Points

Green Operations Building

White Rock, British Columbia, Canada

Owner	*City of White Rock*
Project Team	
Architects:	*Busby & Associates*
Engineers:	*Keen Engineering (mechanical), Fact & Epp (structural), Flagel Lewandowski , (electrical)*
Contractor:	*KDS Construction*
Building Statistics:	
Completion Date:	June 2003
Cost:	*$185 Can per sq foot*
Size:	*6785 gross square feet*
Footprint:	*3573 square feet*
Construction Type:	*Industrial*
Lot Size:	*2 acres*

LEED

Green Operations Building, LEED Project # 0225
LEED Version 2 Certification Level: GOLD
July 28, 2003

44 Points Achieved — Possible Points: 69

Certified 26 to 32 points Silver 33 to 38 points Gold 39 to 51 points Platinum 52 or more points

8 Sustainable Sites — Possible Points: 14

Y	Prereq 1	Erosion & Sedimentation Control	
1	Credit 1	Site Selection	1
	Credit 2	Urban Redevelopment	1
	Credit 3	Brownfield Redevelopment	1
1	Credit 4.1	Alternative Transportation, Public Transportation Access	1
1	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1
	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1
1	Credit 4.4	Alternative Transportation, Parking Capacity	1
	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1
	Credit 5.2	Reduced Site Disturbance, Development Footprint	1
1	Credit 6.1	Stormwater Management, Rate and Quantity	1
	Credit 6.2	Stormwater Management, Treatment	1
1	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1
1	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1
1	Credit 8	Light Pollution Reduction	1

5 Water Efficiency — Possible Points: 5

1	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1
1	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1
1	Credit 2	Innovative Wastewater Technologies	1
1	Credit 3.1	Water Use Reduction, 20% Reduction	1
1	Credit 3.2	Water Use Reduction, 30% Reduction	1

11 Energy & Atmosphere — Possible Points: 17

Y	Prereq 1	Fundamental Building Systems Commissioning	
Y	Prereq 2	Minimum Energy Performance	
Y	Prereq 3	CFC Reduction in HVAC&R Equipment	
2	Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2
2	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2
2	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2
2	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2
	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2
1	Credit 2.1	Renewable Energy, 5%	1
	Credit 2.2	Renewable Energy, 10%	1
	Credit 2.3	Renewable Energy, 20%	1
	Credit 3	Additional Commissioning	1
1	Credit 4	Ozone Depletion	1
	Credit 5	Measurement & Verification	1
1	Credit 6	Green Power	1

6 Materials & Resources — Possible Points: 13

Y	Prereq 1	Storage & Collection of Recyclables	
	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1
	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1
	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1
1	Credit 2.1	Construction Waste Management, Divert 50%	1
1	Credit 2.2	Construction Waste Management, Divert 75%	1
1	Credit 3.1	Resource Reuse, Specify 5%	1
	Credit 3.2	Resource Reuse, Specify 10%	1
1	Credit 4.1	Recycled Content	1
	Credit 4.2	Recycled Content	1
1	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1
1	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1
	Credit 6	Rapidly Renewable Materials	1
	Credit 7	Certified Wood	1

11 Indoor Environmental Quality — Possible Points: 15

Y	Prereq 1	Minimum IAQ Performance	
Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1	Credit 1	Carbon Dioxide (CO_2) Monitoring	1
	Credit 2	Increase Ventilation Effectiveness	1
	Credit 3.1	Construction IAQ Management Plan, During Construction	1
1	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1
1	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1
1	Credit 4.2	Low-Emitting Materials, Paints	1
1	Credit 4.3	Low-Emitting Materials, Carpet	1
1	Credit 4.4	Low-Emitting Materials, Composite Wood	1
1	Credit 5	Indoor Chemical & Pollutant Source Control	1
1	Credit 6.1	Controllability of Systems, Perimeter	1
	Credit 6.2	Controllability of Systems, Non-Perimeter	1
1	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1
	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1
1	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1
1	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1

3 Innovation & Design Process — Possible Points: 5

1	Credit 1.1	Innovation in Design: Exemplary Performance in 98% CWM	1
1	Credit 1.2	Innovation in Design: Exemplary Reduction of Water Use	1
	Credit 1.3	Innovation in Design:	1
	Credit 1.4	Innovation in Design:	1
1	Credit 2	LEED™ Accredited Professional	1

Operations Building Overview

- Located over an abandoned Sanitary Treatment Plant
- Green design measures:
  - A 1,448 sq. ft green roof
  - Potable water consumption reduced by 87%
  - Low-emitting materials
  - 60% better than the Canadian Model National Energy Code (50% of ASHRAE 90.1-1999).
  - Photovoltaic arrays provide 5% of the project's total energy supply.
  - 100% of power procured through BC Hydro's Green Power Certificates.

Materials Re-use

Busby + Associates Architects

Solar DHW & Solar PV

Busby + Associates Architects

Green Roof

Stormwater Re-use

CaG

LEED Silver: 33 Points

Semiahmoo Library & RCMP Station

City of Surrey, British Columbia, Canada

Owner	*City of Surrey*
Design Build Project Team	
Architects:	*Musson Cattell Mackey Partners* *Darrel J Epp Architect*
Contractor:	*Norson Construction*
Engineers:	*VEL Engineering (mechanical), Weiler, Smith Bowers(structural), Flagel Lewandowski (electrical)*
Building Statistics:	
Completion Date:	August 2003
Size:	30,000 *gross square feet*
Footprint:	*10,000 square feet*
Construction Type:	*Institutional*

Semiahmoo Library and Community Policing Station
LEED Project # 0504
LEED Version 2 Certification Level: Silver
January 22, 2004

33 Points Achieved — Possible Points: 69

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	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1
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	Credit 6.1	Stormwater Management, Rate and Quantity	1
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1	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1
1	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1
1	Credit 8	Light Pollution Reduction	1

4 Water Efficiency — Possible Points: 5

1	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1
1	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1
	Credit 2	Innovative Wastewater Technologies	1
1	Credit 3.1	Water Use Reduction, 20% Reduction	1
1	Credit 3.2	Water Use Reduction, 30% Reduction	1

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	Credit 5	Measurement & Verification	1
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	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1
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	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1
	Credit 6	Rapidly Renewable Materials	1
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	Credit 6.1	Controllability of Systems, Perimeter	1
	Credit 6.2	Controllability of Systems, Non-Perimeter	1
1	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1
1	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1
	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1
	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1

3 Innovation & Design Process — Possible Points: 5

1	Credit 1.1	Innovation in Design: Exemplary Performance WEc3	1
1	Credit 1.2	Innovation in Design: Exemplary Performance MRc5.1	1
	Credit 1.3	Innovation in Design:	1
	Credit 1.4	Innovation in Design:	1
1	Credit 2	LEED™ Accredited Professional	1

Semiahmoo Library & RCMP Community Policing Station Overview

- Design-Build competition
- Green design measures:
  - 88% of construction waste recycled or salvaged
  - Potable water consumption reduced by 41%
  - Over 62% of materials from within 500 miles
  - 45% better than the Canadian Model National Energy Code (50% of ASHRAE 90.1-1999).
  - 5% of the building materials with recycled content
  - CO2 monitoring system for HVAC control

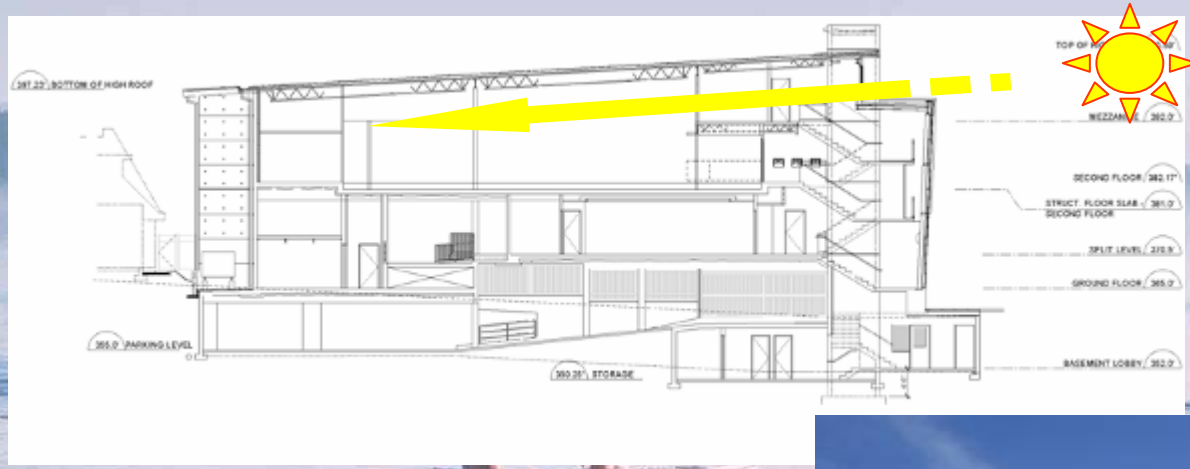
Semiahmoo Library & RCMP Station

City of Surrey

High Perfomance Building Envelope;
High Quality Lighting & Mechanical

Semiahmoo Library & RCMP Station

City of Surrey



Day Lighting Control

MCMP Architects

Natural Ventilation

Semiahmoo Library & RCMP Station

City of Surrey

Recycled Content

MCMP Architects

Dockside, Victoria

Conclusion

We have momentum

We are making a difference

. . Join us!

For more information please visit

www.cagbc.org

Questions

info@cagbc.org